FACT SHEET FOR STATE WASTE DISCHARGE PERMIT NO. ST6035

Alder Lake Park

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INTRODUCTION

This fact sheet is a companion document to the draft State Waste Discharge Permit No.6035 for the Alder Lake Wastewater Treatment Plant. The Department of Ecology (the Department) is proposing to issue this permit, which will allow discharge of wastewater to waters of the state of Washington. This fact sheet explains the nature of the proposed discharge, the Department's decisions on limiting the pollutants in the wastewater, and the regulatory and technical bases for those decisions.

Washington state law (RCW 90.48.080 and 90.48.162) requires that a permit be issued before discharge of wastewater to waters of the state is allowed. Regulations adopted by the state include procedures for issuing permits (Chapter 173-216 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC) and water quality criteria for ground waters (Chapter 173-200 WAC). They also establish the basis for effluent limitations and other requirements which are to be included in the permit.

The purpose of this issuance is to update an incorrect flow number submitted on the original application. This fact sheet and draft permit are available for review by interested persons as described in Appendix A--Public Involvement Information.

The fact sheet and draft permit have been reviewed by the Southwest Office of the Washington State Department of Health and by the Permittee. Errors and omissions identified in these reviews have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Changes to the permit will be addressed in Appendix D--Response to Comments

GENERAL INFORMATION

Applicant:	City of Tacoma, Dept of Public Utilities, Light Division	
Facility Name and Address:	Alder Lake Park 50324 School Road Eatonville, WA 98328	
Type of Treatment System:	Aerated Lagoon	
Discharge Location:	Latitude: 46° 48' 13" N	Longitude: 122° 17' 52" W.
Contact at Facility:	Paul Rehse Telephone #: (206) 569-2778	
Responsible Official:	Russell S. Post P.O. Box 11007 Tacoma, WA 98411-0007 Telephone #: (253) 502-8300	

BACKGROUND INFORMATION

DESCRIPTION OF THE COLLECTION AND TREATMENT SYSTEM

HISTORY

Alder Lake Park is a 161 acre park located near Alder Dam off Highway 7 near the town of Alder. The Alder Lake Campground sanitary sewerage system consists of the 7,000 lineal feet of 1-1/2, 2, 3, 4, 6, and 8 inch diameter gravity and pressure sewers serving 35 campground sites, four restroom buildings, one manager's residence, one bathhouse, and two sanitary RV dump stations.

COLLECTION SYSTEM STATUS

The Alder Lake Campground sewage treatment plant includes primary as well as secondary sewage treatment processes. The treatment of raw sewage begins in the grinder pump stations, and gravity pressure sewers leading to the septic tanks where extended primary treatment occurs. The main sewage pump station pumps the septic tank effluent to the main treatment plant where secondary sewage treatment occurs in the equalization lagoon, wetland cells, and the effluent disinfection and disposal system.

TREATMENT PROCESSES

The septic tank system includes two large underground baffled concrete tanks. The tanks are sized for capacities of 24 and 12 hour detention times, respectively, based on a design peak daily flow of 23,000 gallons per day (gpd). The septic tanks act as a primary clarifier where 80 to 90 percent of the grease 50 to 70 percent of the suspended solids, and 40 to 60 percent of the five-day biochemical oxygen demand (BOD5) are removed. In addition to this treatment anaerobic digestion also takes place.

Septic primary sewage will flow from the septic tanks into the main pump station wet well. One earthen, unlined, aerated 80,000 gallon lagoon is located at the end of the 4-inch force main coming from the main pump station. The purpose of this lagoon is to equalize the flow from the main pump station into the wetland treatment system. A single one-horsepower surface aerator is located in the center of the lagoon.

There are five terraced Wetland Treatment Cells each cell provides a specific process as follows:

> Cell One: planted with two species of bulrushes. These plants grow into dense stands that filter, aerate, and remove nitrogen and phosphorus.
>
> Cell Two: contains a mixture of soft rush and reed canarygrass. These also provide nitrogen removal and also phosphorus and variety of heavy metals and salts.
>
> Cell Three: is a open water and deeper pond. The edges and bottom half are planted to cattail. Duckweed grows on the surface of the open area. The bottom has been pre-loaded with two feet of peat before planting. The peat and cattail combined absorb and bind phosphates. The cattails uptake of nitrogen and heavy metals further improve the aerobic qualities of the effluent.
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> Cell Four: contains a mixture of slough sedge, water horsetail, and red root cyperus. This combination give a good variety of brood leaf dense growth in the summer with a tremendous uptake of phosphorus and heavy metals. Tubers of the red root will continue to remove nutrients from the water even when the plants are dormant.
>
> Cell Five: is a narrow, shallow, grass-filled cell that contains a mixture of bentgrass and horsetail. The mostly open canopy allows sun rays to reach and disinfect the water running

through the short grass. The cell is sloped at 3 percent to accelerate the gravity flow and stimulate oxygenation and gaseous removal.

Treated sewage effluent flows by gravity from Cell Five through a concrete drain trench and 6 inch PVC sewer pipe into a 750 gallon septic tank used as a chlorine contact chamber. A small 1/4 horsepower electric mixer is mounted in the first compartment of the underground chlorine contact tank to assure complete mixing of the effluent and chlorine solution.

DISTRIBUTION SYSTEM (SPRAYFIELD)

The effluent disposal system consists of a duplex effluent pump station and twin, 2-inch diameter perforated, PVC pressure distribution pipes each 232 feet long. When the effluent from the chlorine contact tank fills to a preset level in the pump station wet well, a mercury float switch is activated and 46 gpm is pumped into one of the 2-inch perforated disposal pipelines. Each pipe is laid on a bed of crushed rock in the Alder forest and balanced hydraulically for equal disposal along the length of the perforated pipe.

RESIDUAL SOLIDS

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the primary and secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum and screenings are drained and disposed of as solid waste at the local landfill. Solids removed from the septic tanks should be hauled to a biosolids or waste water treatment facility or land applied if permitted by Tacoma-Pierce County Health Department.

PERMIT STATUS

The previous permit for this facility was issued on May 24, 1988.

An application for permit renewal was submitted to the Department on November 12, 1993, and accepted by the Department on January 24, 1994.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility last received an inspection on July 17, 1997.

During the history of the previous permit, the Permittee has remained in compliance based on Discharge Monitoring Reports (DMRs) and other reports submitted to the Department and inspections conducted by the Department. Recent flow violations led to the discovery of an incorrect design flow number submitted on a previous permit application. The flow design limit has been corrected.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the permit application and in discharge monitoring reports. The proposed wastewater discharge prior to infiltration or land application is characterized for the following parameters:

Table 1: Wastewater Characterization from November 1995 to October 1997 DMR data

Parameter	Monthly Average
Flow	.013841 mgd
Flow, Max.	.1242 mgd
BOD influent	132.25 mg/L
TSS influent	67.57 mg/L
pH effluent	6.7 S.U.
BOD effluent	3.4 mg/L
BOD effluent	.625 lbs/day
TSS effluent	11 mg/L
TSS effluent	.62 lbs/day

PROPOSED PERMIT LIMITATIONS

State regulations require that limitations set forth in a waste discharge permit must be either technology- or water quality-based. Wastewater must be treated using all known, available, and reasonable methods of prevention, control and treatment (AKART) and not pollute the waters of the state. The minimum requirements to demonstrate compliance with the AKART standard are derived from the *Design Criteria for Municipal Wastewater Land Treatment*, and Chapter 173-221 WAC.

The more stringent of the water quality-based or technology-based limits are applied to each of the parameters of concern. Each of these types of limits is described in more detail below.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

All waste discharge permits issued by the Department must specify conditions requiring available and reasonable methods of prevention, control, and treatment of discharges to waters of the state (WAC 173-216-110).

GROUND WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's ground waters including the protection of human health, WAC 173-200-100 states that waste discharge permits shall be conditioned in such a manner as to authorize only activities that will not cause violations of the Ground Water Quality Standards. Drinking water is the beneficial use generally requiring the highest quality of ground water. Providing protection to the level of drinking water standards will protect a great variety of existing and future beneficial uses.

GROUNDWATER CRITERIA	
Total Nitrogen	10 mg/L
Total Dissolved Solids	500 mg/L
pH	6.5 to 8.5 S.U.

The Department has reviewed existing records and is unable to determine if background ground water quality is either higher or lower than the criteria given in Chapter 173-200 WAC; therefore, the

Department will use the criteria expressed in the regulation in the proposed permit. The discharges authorized by this proposed permit are not expected to interfere with beneficial uses.

Background water quality is not defined for this facility. The permit requires that ground water monitor wells be installed and that a ground water monitoring program be developed. During the initial sampling, background water quality and compliance with the ground water quality standards will be determined. If compliance with the ground water standards cannot be achieved, then additional treatment will be required. A compliance schedule will be developed, if needed, to assure long term compliance and ground water protection.

COMPARISON OF LIMITATIONS WITH THE EXISTING PERMIT

Table 2: Comparison of Previous and New Limits

Parameter	Existing Limits	Proposed Limits
Biochemical Oxygen Demand (5-day)	30 mg/L 1.1 lbs/day	30 mg/L
Suspended Solids, Total	30 mg/L 1.1 lbs/day	30 mg/L
Total Coliform	230/100 ml	230/100 ml
pH	shall not be outside range 6 to 9	

MONITORING WELL LOCATION AND DESIGN PROPOSAL

Alder Lake Park will be required to submit a monitoring well location and design proposal to the Department within 180 days of the effective date of the permit. The proposal will contain what Alder Lake Park believes to be the optimal location and design for monitoring wells in order to obtain the most representative upgradient and downgradient ground water quality data. The Department must approve the proposal prior to the construction of the wells. Monitor wells must be installed within 180 days of the Department's approval of the report.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are specified to verify that the treatment process is functioning correctly, that ground water criteria are not violated, and that effluent limitations are being achieved (WAC 173-216-110).

INFLUENT AND EFFLUENT MONITORING

The monitoring and testing schedule is detailed in the proposed permit under Condition S1 and S2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

GROUND WATER MONITORING

Ground water monitoring must being within 30 days after the monitor wells have been installed and developed. Ground water will be monitored monthly for the following parameters:

PARAMETERS
Static water level
Temperature
pH
Electrical Conductivity
Dissolved Oxygen
Total Dissolved Solids
Nitrate (as N)
Total Kjeldahl Nitrogen (as N)

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 273-216-110).

FACILITY LOADING

The design criteria for this treatment facility are taken from the August 1988 engineering report prepared by Horton Dennis and Associates and are as follows:

Monthly average influent flow (max. month):	22,000 gpd
Monthly average dry weather flow:	22,000 gpd
Monthly average wet weather flow:	1500 gpd

The permit requires the Permittee to maintain adequate capacity to treat the flows and waste loading to the treatment plant (WAC 173-216-110[4]). The Permittee is required to submit an engineering report when the plant reaches 85 percent of its flow or loading capacity. For significant new discharges, the permit requires a new application and an engineering report.

OPERATIONS AND MAINTENANCE

The proposed permit contains condition S.5. as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water pollution the Permittee is required in permit condition S7. to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and state Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503. The disposal of other solid waste is under the jurisdiction of the local health district.

Requirements for monitoring sewage sludge and recordkeeping are included in this permit. This information will by used by Ecology to develop or update local limits and is also required under 40 CFR 503.

GENERAL CONDITIONS

General Conditions are based directly on state laws and regulations and have been standardized for all industrial waste discharge to ground water permits issued by the Department.

Condition G1 requires responsible officials or their designated representatives to sign submittals to the Department. Condition G2 requires the Permittee to allow the Department to access the treatment system, production facility, and records related to the permit. Condition G3 specifies conditions for modifying, suspending or terminating the permit. Condition G4 requires the Permittee to apply to the Department prior to increasing or varying the discharge from the levels stated in the permit application. Condition G5 requires the Permittee to submit written notice of significant increases in the amount or nature of discharges (typically new industrial discharges) into the sewer system tributary to the permitted facility. Condition G6 requires the Permittee to construct, modify, and operate the permitted facility in accordance with approved engineering documents. Condition G7 prohibits the Permittee from using the permit as a basis for violating any laws, statutes or regulations. Condition G8 requires application for permit renewal 60 days prior to the expiration of the permit. Condition G9 requires the payment of permit fees. Condition G10 describes the penalties for violating permit conditions.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, and to protect human health and the beneficial uses of waters of the state of Washington. The Department proposes that the permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

Faulkner, S.P., Patrick Jr., W.H., Gambrell, R.P., May-June, 1989. Field Techniques for Measuring Wetland Soil Parameters, Soil Science Society of America Journal, Vol. 53, No.3.

Washington State Department of Ecology, 1993. Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems, Ecology Publication # 93-36. 20 pp.

Washington State Department of Ecology, 1996. Implementation Guidance for the Ground Water Quality Standards.

Washington State University, November, 1981. Laboratory Procedures - Soil Testing Laboratory. 38 pp.

APPENDICES

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page one of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on December 10, 1993, in the *Tacoma News Tribune* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department published a Public Notice of Draft (PNOD) in the *Eatonville Dispatch* on April 29, 1998, to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-216-100). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6279, or by writing to the address listed above.

APPENDIX B--GLOSSARY

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation--The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of the collection or treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Distribution Uniformity--The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

Engineering Report--A document, signed by a professional licensed engineer, which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater

facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Soil Scientist--An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5,3,or 1 years, respectively, of professional experience working in the area of agronomy, crops, or soils.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Coliform Bacteria--A microbiological test which detects and enumerates the total coliform group of bacteria in water samples.

Total Dissolved Solids--That portion of total solids in water or wastewater that passes through a specific filter.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent pollution of the receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

APPENDIX D--RESPONSE TO COMMENTS

Permit Type: State Waste Discharge Permit

Permit Number: ST 6035

Permittee: City of Tacoma
Department of Public Utilities Division
3628 South 35th
Tacoma, WA 98408

Permitting Authority: Washington State Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Ecology has either quoted or paraphrased the comments. The comments, Ecology's response, and the resulting permit action follow:

Comment from Tacoma Public Utilities (Summarized)

Comment: The Alder Park treatment plan has a significant inflow and infiltration (I/I) problem resulting in discharge flow rates in excess of off-season design criteria during heavy rain. We have developed the attached plan to identify and remediate significant sources of I/I. Please review and incorporate this plan as part of our renewed permit.

Response: Ecology will incorporate the plan and schedule to evaluate the treatment plant performance and achieve compliance with the winter flow effluent limit into Condition S.4. of the permit.